Strengthening of Ethic Professional Learning Community: e-PLC in Pre-service Teacher

Chanasith Sithsungnoen*, Wisud Po Ngern & Siriwan Vanichvattanavorachai

Department of Curriculum and Instruction, Faculty of Education, Silpakorn University, Nakornpathom, 73000 Thailand

Article info

Abstract

The research objectives are 1) to create Ethic Professional Learning Community: e - PLC, 2) to evaluate ethics of pre-service teachers, 3) to evaluate teaching abilities of pre-service teachers and 4) to study the pre-teachers and mentors' satisfaction after using the e-PLC. The population for the study consisted of staff from 7 joint schools consisting of administrators, teachers, pre-service teachers, supervisors and mentors, a total of 442 people. Research tools include 1) the Ethic Professional Learning Community: e-PLC, 2) ethic reflection form, 3) focus group discussion topics and 4) satisfaction questionnaire. The data were analyzed by percentage, average, standard deviation, and content analysis.

The research results show that:

1. The Ethic Professional Learning Community: e-PLC had 6 steps that include 1) communicating, 2) objective setting, 3) small group meeting, 4) planning and designing, 5) lesson studying and 6) reflecting.

2. The ethics of pre-service teachers were found in 5 areas: 1) self code of ethics, 2) professional code of ethics, 3) code of ethics for service providers, 4) code of ethics for professional participants and 5) ethics for society.

3. The teaching abilities of pre-service teachers include 1) knowledge about teaching, 2) teaching strategies and 3) classroom management.

4. The satisfaction of pre-service teachers and mentors was shown at a high level ($\overline{\mathrm{X}}$= 3.85).

Introduction

The teacher professional and educational staff ethics are important features that are set from The Teachers' Council of Thailand in the education field. The plan is created to provide effective desirable behavior including awareness of responsibility, goodness, moral principles, ethics and being a good model for people in the community and clients as well (Secretariat Office of the Teachers Council of Thailand, 2005). The aims of professional ethics are constructing self-discipline, self-development, mission, good-behavior and duty realization of teacher and educational staff. Moreover,

* Corresponding Author
  e-mail: sithchon@hotmail.com

it includes receiving acceptance, love and faith from people, being honesty, having responsibility, paying attention, facilitating and empowering students and clients, and supporting each other creatively by insisting on moral principles and ethics (Secretariat Office of the Teachers Council of Thailand, 2006). Faculty of Education, Silpakorn University is an educational organization that has a vital task to develop education. In addition, the faculty emphasizes educating present students and graduates to be teachers who have competency as the Teachers Council of Thailand specifications that provided the opportunity and course for developing the efficiency of each student. Thus, students who pass all teacher professional courses are considered qualified as mentioned in standard of teacher professional components for 1 academic year including knowledge, operation and conduction. The students are professional developed in their subject areas in contacted school of Faculty of Education, also supervising teachers and supervisors are facilitators and supporters in professional development.

The previous professional internship course of Faculty of Education, Silpakorn University, which emphasize on designing activities, creating materials, assessment and evaluation, class controlling in teaching. All duties mentioned above are not related to teacher's ethics. Thus, could cause a level of ignorance from school administrators, supervisors, and mentors. Moreover, the professional internship course provides chance for internal staff in the school, but the supervisors are accepted for pre-service teachers' professional development. This is the reason why professional internships are not responding to social needs, especially in communication, ethics, creative learning atmosphere, parents' cooperation, and etc. The 21st era teachers' competency (Florida Education Standards Commission) suggests that teachers must have competency including: 1) using various types of evaluation, 2) using effective technique communication, 3) continual joining professional learning development, 4) using appropriate strategies to arouse student thinking, 5) using various teaching strategies, 6) having ethics, 7) providing supported learning environment, 8) understanding subject contents, 9) contributing to learning atmosphere, 10) planning and applying various uses, 11) cooperative working with colleges, parents, and stakeholders and 12) using technology suitably for teaching.

Professional learning community or PLC is cooperative work between teachers, school administrators, and educators in order to develop learning abilities of students. This concept is based on learning ability of organizations, which are described as schools being a learning community. The community has the same value, concept, and member relationship. All members have the same value, objective, academic relationship, in addition interdependent relationship, cooperative working, good association, and collaborative responsibility are important for community. In contrast from the concept of organization, the relationship among each member is arranged by stages, control machinery, and plenty of organization rules and cultures (Thompson, Gregg, & Niska, 2004; Sergiovanni, 1994; Hord, 1997; Senge, 1990; Panich, 2012). The PLC provides benefit to both teachers and learners (Chookamnerd & Sungtong, 2014). Moreover, DuFour, & Eaker (1998) stated that there are three basic concepts of PLC including 1) ensuring that student learn, 2) a culture of collaboration and 3) a focus on results.

Consequently, professional learning community or PLC is a tool for continuously and sustainable professional development. It was developed from learning operating and reviewing, which is affected on students learning and operative working as well (Ministry of Education (MOE), 2009). Providing professionalism, empathy, equality of value and emotion of teachers, and spontaneity are features for creating PLC in schools. Technology is considered as tools in PLC for developing teacher professional ethics (Ethic Professional Learning Community: e–PLC) in order to be more convenient. So that, pre-service teacher or members operate via Google classroom used as an instrument for sharing, advising and suggesting through online network. Pre-service teachers, mentors, school administrators and experts share knowledge and experiences on topics of teacher professional ethics and morality. It is the way of transferring knowledge for good modeling from supervising teacher to pre-service teacher, and teachers share opinions and suggestions to each other. Then, the results of operations are to build awareness of teacher professional ethics and provide well conduction that PLC members could apply in their teaching and learning. Due to online PLC is based on community of people who use technology as a medium in group operation focused on practice in real situation. Likewise, getting cooperative supports from PLC members to be the Online Learning Community (Na-Songkhla, 2010).

According to information above, the researchers realized the importance of teacher professional ethics development of pre-service teacher through Ethic Professional Learning Community: e-PLC of the Faculty of Education, Silpakorn University with joint schools for teacher professional development.

Objectives

The objectives of this study were to:

1. Create procedures of Ethic Professional Learning Community: e-PLC.

2. Evaluate teacher professional ethics of pre-service teachers after using Ethic Professional Learning Community: e-PLC.

3. Evaluate learning management abilities of pre-service teachers after using Ethic Professional Learning Community: e-PLC.

4. Study satisfaction of pre-service teachers and mentors after using Ethic Professional Learning Community: e-PLC.
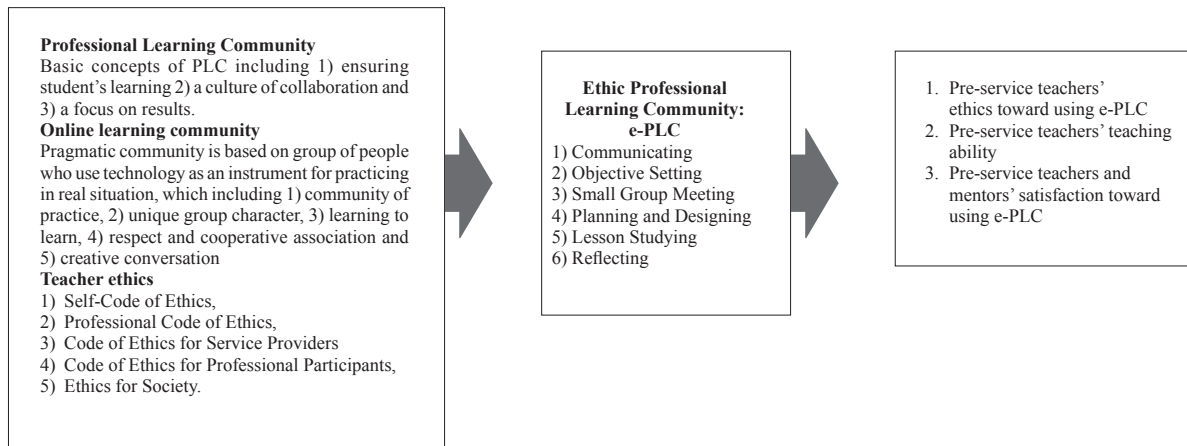
Literature review

A professional learning community or PLC is a cooperation between teachers, administrators, and school educators to develop the learning progression of students. The PLC is defined as a community of learning instead of an organization. The community emphasis is on value, idea, and member relationship, in contrast to the organization who focuses on the position of members, control, as well as the organizational structure that emphasizes the use of power. Thus, the PLC cooperatively focus on the same value and objectives, that is clarified as the relationship between PLC members. The academic relationship is defined as members' relationship which they must rely on others and work cooperatively for enhancing students. All members have good connections, commitment, careful expression, and collaborative responsibility (Thompson, Gregg, & Niska, 2004; Sergiovanni, 1994; Hord, 1997; Senge, 1990; Sergiovanni, 1994; Panich, 2012). The PLC provides benefits to both teachers and students (Chookamnerd & Sungtong, 2014, Professional Institute of Education, Office of the Basic Education Commission of Ministry of Education, 2014).

Na-Songkhla (2010) stated that PLC originated from a practical community, that uses online technology for community operations. The online learning community emphasis is on practicum to use in the real situation and people and is supported by community members. The procedures of using the online learning community consists of the following: 1) approach and motivate inspiration, 2) create online learning relationships and 3) share information and knowledge. Besides, the components of the online learning community include: 1) community of practice, 2) characteristic of the online learning community, 3) community condition, 4) teachers' role and 5) online learning method.

Secretariat Office of the Teachers Council of Thailand operations follow the Teachers and Educational Personnel Council Act, B.E. 2546 that specifies professional standards and ethics, especially the professional ethics that includes nine specifications. 1) Self-ethics focus is on people working in the educational field who must have self-disciplinary, self-professional, characteristic, and vision development and the ability to respond to up-to-date technology, economy, and politics. 2) Professional ethics focus is on people working in the educational field should love, believe, be honest, be responsible, and be a good member of a professional organization. 3) Ethics for service providers which educational workers must follow includes: (3.1) love, be merciful, care, help, support, enhance and encourage students and service providers, (3.2) support students' learning skills and promote habits and manners of students and service providers, (3.3) be the desirable physical and mind role model, (3.4) not be an antagonist to physical, mental, emotional, and social of students and service providers, (3.5) provide sincere and equal service without requirement or acceptance of benefit. 4) Ethics for professional participants, educational workers must help and support creatively, and also adhere to moral principles. And 5) Ethics for society, the educational workers must behave as the conservative and developed leaders for enhancing the economy, society, religion, culture, wisdom, environment, protect society interests and also hold firm to the Council for Democratic Reform under Constitutional Monarchy (The Teachers' Council of Thailand, 2005, 2006).

Conceptual Framework

Professional Learning Community
Basic concepts of PLC including 1) ensuring student's learning 2) a culture of collaboration and 3) a focus on results.
Online learning community
Pragmatic community is based on group of people who use technology as an instrument for practicing in real situation, which including 1) community of practice, 2) unique group character, 3) learning to learn, 4) respect and cooperative association and 5) creative conversation
Teacher ethics
1) Self-Code of Ethics,
2) Professional Code of Ethics,
3) Code of Ethics for Service Providers
4) Code of Ethics for Professional Participants,
5) Ethics for Society.

Ethic Professional Learning Community: e-PLC
1) Communicating
2) Objective Setting
3) Small Group Meeting
4) Planning and Designing
5) Lesson Studying
6) Reflecting

1. Pre-service teachers' ethics toward using e-PLC
2. Pre-service teachers' teaching ability
3. Pre-service teachers and mentors' satisfaction toward using e-PLC

Research questions

1. What are the procedures of Ethic Professional Learning Community: e-PLC?

2. What are the results of pre-service teachers' ethics after using e-PLC and how?

3. What are results of pre-service teachers' teaching abilities after using e-PLC and how?

4. What is the satisfaction level of pre-service teachers and mentors after using e-PLC?

Scopes of research

1. Subject of the study

For this research 9 organizations and joint schools volunteered to be the subject of this research which includes the following: 1) Kanchanapisek Wittayalai School, 2) Municipal 4 Chaopreecha-utit School, 3) Tawarawadee School, 4) Princess Sirindhorn's College, 5) Wathuaichorakhe Witthayakom School, 6) Phrong Madua Wittayakhom School, 7) Rachinee Burana School, 8) Nakhon Pathom Provincial Education Office and 9) Nakhon Pathom Primary Educational Service Area Office 1

Participants included 13 school administrators, 349 teachers, 66 fifth-year pre-service teachers from 5 subject areas, including Thai language, Social studies, English, Chinese, and Elementary teaching, 10 supervisors and 4 supervising teachers, a total of 442 people.

2. Time period

June-October 2018, a total of 4 months

3. Variables

Independent variable: Ethic Professional Learning Community: e-PLC

Dependent variables: including

1. The ethics of pre-service teachers

2. The teaching abilities of pre-service teachers

3. The satisfaction of pre-service teachers and mentors toward Ethic Professional Learning Community: e-PLC

Research methodology

The study was conducted through action research in education which emphasizes on action orientation. The action research was implemented with a professional learning community for driving professional ethics change and to study the results of orientation for further development.

1. Research instruments

1.1 The procedures of Ethic Professional Learning Community: e-PLC via Google Classroom;

1.2 The reflection of teacher professional ethics of pre-service teachers;

1.3 Focus group discussion topics about the learning management abilities of pre-service teachers; and

1.4 The satisfaction questionnaire for the pre-service teachers and mentors after using the Ethic Professional Learning Community: e-PLC.

2. Procedures

The 3 steps of research procedures consist of the following:

Step 1: Design and development (D), Concept theories and related research were analyzed and synthesized for drafting Ethic Professional Learning

Community: e–PLC. Then, the results from analysis and synthesis provided 6 steps of e-PLC including: 1) communicating, 2) objective setting, 3) small group meeting, 4) planning, 5) lesson studying and 6) reflecting. After that, the researchers submitted Ethic Professional Learning Community: e-PLC draft to 5 experts to check the appropriateness by using evaluation form with a five-point rating scale. The form included aspects of content and theoretical appropriateness, accuracy, feasibility, utility and process value; the average was 4.35. Then, process name, activities, language use, and suggestion were used to find the Index of Item Objective Congruence (IOC), that should be in the range of 0.50-1.00.

Step 2: Implementation (I), The 6 steps of ethic professional learning Community: e-PLC were used with 7 joint schools of Faculty of Education, Silpakorn University including 1) Kanchanapisek Wittayalai School, 2) Municipal 4 Chaopreecha-utit School, 3) Tawarawadee School, 4) Princess Sirindhorn's College, 5) Wathuaichorakhe Witthayakom School, 6) Phrong Madua Wittayakhom School and 7) Rachinee Burana School. E-PLC was implemented by school administrators, deputy directors of school, head staff of subject area departments, mentors and supervising teacher during June-October of 2018, for a total of 1 semester.

Step 3: Evaluation (E), Effectiveness of Ethic Professional Learning Community: e-PLC was evaluated in the aspects that follow:

1. The reflection of teacher ethics of pre-service teachers was reflected through using reflection form by conducting a reflecting technique. The reflection was proceeded by school administrators, mentors and buddy teachers in 4 aspects: 1) self-ethics, 2) professional ethics, 3) client ethics and 4) related staff professional ethics. The conducted reflection form was submitted to 5 experts in order to evaluate validity (IOC), then chosen items between 0.50-1.00 were selected to use (IOC=1.00) in reflection for gathering various information.

2. The focus group discussion was used by mentors and buddy teachers for evaluating learning management abilities of pre-service teachers in 3 aspects: 1) knowledge and understanding of leaning management, 2) teaching strategies and 3) classroom management. The focus group discussion questions were submitted to 5 experts for evaluating IOC, the validity was 1.00. The experts also suggested the reflecting technique for gathering fact and depth information.

3. The satisfaction questionnaire of pre-service teachers and mentors toward Ethic Professional Learning Community: e-PLC was evaluated by a satisfaction evaluation form with rating scales of 5 levels and 3 open-ended questions in 3 aspects: 1) procedures, 2) operative evaluation and 3) impact. The satisfaction questionnaire was submitted to five experts that included three professional teaching practicum experts and two experts of the professional learning community for evaluating IOC (0.50-1.00), then edited as experts' suggestion for instance easy test, ambiguous questions, unobjective question, etc. The researcher edited and improved following the suggestions, then used for collecting information.

Data analysis

1. Content analysis was used to analyze ethics information from reflection and focus group discussion about the teaching abilities of pre-service teachers.

2. Average and standard deviation were used to analyze the level of satisfaction of pre-service teachers and mentors toward e-PLC.

Research results

The enhancement of Ethic Professional Learning Community: e-PLC for pre-service teacher, the results show that:

1. The procedures of Ethic Professional Learning Community: e-PLC consist of the following:

1.1 Communicating by inviting schools as a professional training centers and network schools to join this program.

1.2 Objective setting was considered for developing teacher professional ethics.

1.3 Small group meeting.

1.4 Planning and designing was conducted to educate. The working team, provided information about background and details of the program, and then did the workshop on the topic of 1) steps of sign in the member of professional development, 2) usage an of Google Classroom and 3) Activities and time line in professional development program via Google Classroom.

1.5 Lesson studying consists of 3 phases: 1) plan, 2) do by bringing lesson plans to use in class and 3) see by reflecting the effect of using lesson plans. As phases mentioned, school administrators, mentors, and buddy teachers had to redo lessons studying three times and also monitor the effects. Monitoring via Google Classroom online was used as a tool for monitoring

teachers' participation.

      1.6 Reflecting was provided for opinions of school administrators and teachers in the program. The procedures of Ethic Professional Learning Community: e-PLC are shown in figure 1

pre-service teachers provide correct information for making correct understanding between colleagues, participate in community activity both directly and indirectly and behave as good role models in supporting both nation, religion and royal institution.

**The processes of Ethic Professional Learning Community:
e-PLC, Faculty of Education, Silpakorn University**
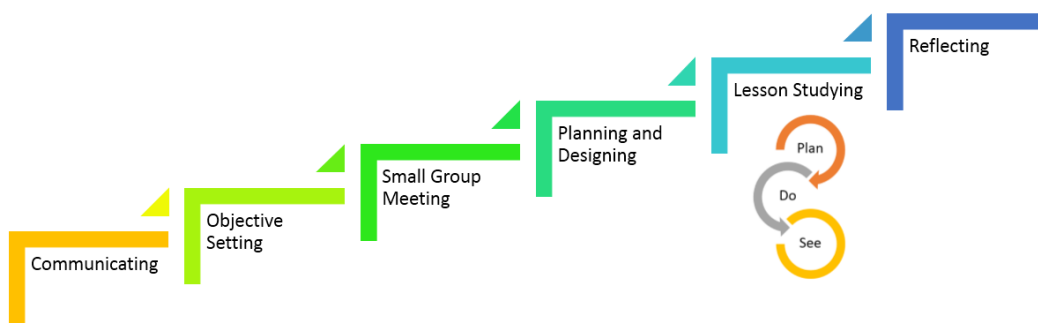
Figure 1 The Processes of Ethic Professional Learning Community: e-PLC), Faculty of Education, Silpakorn University

    2. The teacher professional ethics of pre-service teachers were reflected by school administrators, mentors and buddy teachers in 4 aspects, as follows:

      2.1 The self-ethics, the result showed that pre-service teachers conducted appropriately, work responsibly, operate earnestly, follow the school rules, be a good model, study increasingly, have intended plan for professional development, adjust manners and seek new information for professional developing.

      2.2 The professional ethics, the result showed that pre-service teachers appreciate and believe in professional values, stick to professional principles, use various knowledge, share opinions with colleagues and be proud in their profession.

      2.3 The client ethics, the result showed that pre-service teachers willingly give advice to students, kindly take care of their students, support individual development, reinforce good manner of students, punish according to set conditions logically and give favor to the public continuously.

      2.4 The related staff professional ethics, the result showed that pre-service teaches help colleagues generously, have good relationship and unity for continuously quality developing, reveal beneficial information to others, have responsibility of their errors and respect each other.

      2.5 The social ethics, the result showed that

    3. The teaching abilities of pre-service teachers after using Ethic Professional Learning Community: e-PLC are evaluated by mentors and buddy teachers through focus group discussion in 3 aspects: 1) knowledge and understanding of leaning management, 2) teaching strategies and 3) classroom management, the results showed that:

      3.1 The knowledge and understanding of learning management are pre-service teachers are able to design interesting lesson plans, use active learning in the learning activity, cover completed learning objectives, indicators and learning achievements: knowledge, process, and attitude, design activities that cover 3 aspects and use appropriate assessment and evaluation.

      3.2 The teaching strategies revealed that pre-service teachers are able to motivate their students, explain to help students connect prior knowledge with new knowledge, create learning activity consistent with individual learning styles, use a variety of assessments for assessing students' higher-order thinking, give reflection, provide a chance for students to manage and participate enthusiastically, build up students' confidence and adjust teaching strategies.

    4. The classroom management showed that pre-service teachers have a positive relationship between teacher and students, support the positive relationship between students, check facilitated tools in the classroom,

use needed information to develop students' proficiency, provide chances for students for setting classroom rules and conditions, solve students' disciplines, create positive classroom disciplines, evaluate and monitor classroom in order to develop classroom.

5. The satisfaction of pre-service teachers and mentors toward Ethic Professional Learning Community: e-PLC in 3 aspects: 1) procedures, 2) operative evaluation and 3) impact evaluation. The results are shown in table 1:

Table 1: The satisfaction of pre-service teachers and mentors toward Ethic Professional Learning Community: e - PLC

Aspects	$\overline{X}$	S.D.	level
1. Procedures	3.88	0.98	high
2. Operative evaluation	3.82	0.94	high
3. Impact evaluation	3.84	1.03	high
total	3.85	0.98	high

According to the table, it reveals that pre-service teachers and mentors have overall satisfaction at a high level ($\overline{X}$= 3.85), and all aspects are shown at a high level

The answers from open-ended questions reveal that:

1. Procedure:

1.1 Mentors supported and encouraged the confidence of pre-service teacher in teaching. That also included sharing, reflection, giving favor for designing learning activity, designing tasks. Then, pre-service teacher would increase their confidence in conducting teaching and learning activities. The procedures of PLC provided the way for learning and applying. Moreover, the procedure emphasized on teachers' professional ethics and morality, which reminded the rules and behaviors for pre-service teacher to realize the way of conducting and important usage for being good teachers.

1.2 Pre-service teachers (fifth-year students) tended to review and present their lesson plans via Google Classroom. Thus, all participants were able to see the other suggestions and comments. Pre-service teachers also assessed themselves to improve their lesson plans. Then, all pre-service teachers learnt to edit and improve together at the same time, it saved time and provided benefit to pre-service teacher for developing.

2. Operative evaluation, are discussed in two phases following:

2.1 Pre-phase

(1) The responsive emails from professional development were delayed.

(2) Teachers who participated in this program were unskilled in using Google Classroom.

2.2 While-phase

(1) Lesson study of pre-service teachers did not follow the program schedule.

(2) Some buddy teachers did not give advice in planning phase due to time limitation.

(3) Some buddy teachers tended to read the printed document instead of online.

3. Impact evaluation of e-PLC revealed that pre-service teacher had interactions between colleagues for developing teaching and learning. They tended to share new ideas for teaching, that could gain new skills as well. E-PLC built confidence and trust of pre-service teachers. In addition, e-PLC provided a friendly atmosphere such as talking and empowering others in PLC time through online.

Discussion

1. Ethic Professional Learning Community: e-PLC consists of 6 steps that include: 1) communicating, 2) objective setting, 3) small group meeting, 4) planning, 5) lesson studying and 6) reflecting. That is verified by experts in order to ensure the content and structure validity, and quality appropriate to use in developing teacher professional ethics. According to the results, Ethic Professional Learning Community: e-PLC is designed through systematic processes that begins with conducting assessment analysis (NA) from relevant documents and research about educational principles, teacher professional ethics, professional learning community (PLC) and information and communication technology (ICT). Hence, e-PLC also provides benefit to teachers, such as decreases isolation of teachers' duty, and increase commitment toward schools' mission and goal. Teachers enthusiastically cooperated for reaching goals and being responsible on their duty to develop students, named "powerful learning". Thus, it affects positively on their teaching and improves teachers professionalism, then internal inspiration occurs and influence on students' learning. This is consistent with Chookamnerd & Sungtong (2014) claim that professional learning community had effect on teachers' inspiration for developing both their profession and learners. In addition, teachers tended to adjust their teaching in order to be consistent with characteristic of learners. Panich (2012) also claims that professional learning community is a continuous process which provides both teachers and students to work collaboratively in order to reach and

ensure better learning. Thus, the important of professional learning community emphasis is on creating effective learning processes of students. Collaborative working is considered as the feature of efficiency especially promoting students' learning quality. The routine work is assigned to all staff, which means everyone has to work collaboratively and have a strong commitment to reach the goal (DuFour & Eaker,1998). Furthermore, the processes of Ethic Professional Learning Community: e-PLC focuses on the use of 3 cycles of lesson study that include 1) plan, 2) do and 3) see. Information and communication technology were used to be a medium for communicating with all participants, they could communicate to others via network. In contrast, network could build the social relationship by itself, but designing and management of using network were important for creating social interaction. Consistency with Na-Songkhla (2010) noting online professional learning community is based from active users who use technology as a medium for group interactions that practice through real situations and people, and members collaboratively support into online learning community.

2. Teacher professional ethics was reflected by pre-service teachers, buddy teachers, supervisors, mentors and school administrators revealing that pre-service teachers had all teacher professional ethics that include: 1) self-ethics, 2) professional ethics, 3) clients ethics, 4) related staff professional ethics and 5) social ethics. The results are due to Ethic Professional Learning Community: e-PLC; the processes that school administrators, buddy teachers, supervisors and mentors were grouped for developing pre-service teachers' professional ethics via ICT and took responsible in order to support and improve pre-service teachers. All stakeholders actively participated, avoided ignorance and respond (Lurkers). Hence, they used various techniques for improving such as giving morale to pre-service teacher to create learning, adjusting teaching, behavior and their ethics. The informal seminar was provided to support pre-service teachers for self-evaluation continuously. Consistency with Na-Songkhla (2010) noting that the teachers' role in online learning context is an important role which creates atmosphere for doing online community. The teachers' role creates interaction and tasks, cooperation, using teaching strategies, taking care, monitoring, evaluating, reflecting and making trust between learners.

3. Learning management abilities of pre-service teachers after using Ethic Professional Learning

Community: e-PLC revealed that pre-service teachers 1) had knowledge and understanding of leaning management, 2) had teaching strategies and 3) had classroom management. The results are due to the fifth step of e-PLC processes; Lesson study with the 3 steps 1) plan, 2) do and 3) see. Thus, model teacher, school administrators, mentors and buddy teachers had to complete 3 cycles of processes and did it via online. The monitoring process and activity participation used online Google Classroom for 3 times per a cycle. The classroom observation and reflection were set 2-3 times for reflecting on pre-service teachers' teaching and students' behavior after the observation. The classroom observations, schedules, tools and evaluation forms, and reflection were used before using in the real situations. This is consistent to DuFour & Eaker (2009) claims that professional learning community are action orientation leaning by doing. All participants brought concept and idea to use in a real situation. Moreover, the team collaborative investigation and conduct gives rapid and profound change that is greater than individually working. In addition, having commitment to continuous improvement would let participants collaborative seek ways for reaching school goals. Ngamkanok (2013) researched about lesson study in order to improve teaching. All group members gave suggestions about learning management of teacher, making decision about teaching topic, and applying learning for next lessons. This is consistent with Stigler & Hiebert (1999) claims that collaborative lesson improvement needs attempts from all participants. Thus, that would be the tool for continue development in teaching by cautiously observation to learners and work collaboratively for making meaningful instructions for learners. A member of the group conducted a lesson plan and the rest of the members were the observers, note takers, and data collectors about learning and teaching according to mentioned schedule. The data collection emphasized on behaviors that indicated learning and thinking of students. Then, collected data were used to construct concept for developing better teaching and learning that included students' production, learning motivation, behavior and attitude toward learning. The process focused on aspect of teaching and learning for developing instead of nature permanent behavior of teacher or leaners. The observation had to operate along with post teaching reflection in order to gain knowledge, perspective and ideas for use in the classroom. The process of having interaction between all related participants for collecting knowledge,

ideas and teachers' conduct, all mentioned above, are features for effective responding to learners appropriately.

4. Satisfaction of pre-service teachers and mentors toward Ethic Professional Learning Community shows that pre-service teachers and mentors were satisfied with overall aspects of e-PLC at a high level ($\overline{X}$= 3.85) due to the 6 steps systematic processes. According to educational principle of Ministry of Education, that desire teachers to create professional leaning community (PLC) and help together for developing learning via ICT. Thus, Panich (2012) stated that teachers of 21st century needed to "teach less learn more." Students had to learn actively by themselves for building 21st century skills and with less emphasize on only content area-based learning. Teachers do not need to teach but should focus on designing and facilitating for supporting students to do by themselves. Computing and ICT literacy are the important skills for learning through technology-based learning, and also students could learn via various kind of electronic devices. For using ICT, teachers need to have knowledge of the school's capability of ICT in the classroom as well as the relevant knowledge to apply ICT in their teaching. Moreover, teachers need to apply ICT knowledge and search for information such as picture, audio, news and interested issues to support learners for developing their thinking and responding to students' interest. In addition, Ministry of Education (2008) specified learning processes of core curriculum that learners needed various learning processes for reaching the goal of curriculum in student-centered approach. The vital learning processes were integrated learning, knowledge construction, thinking, social, problem-solving, experimental leaning, doing, management, research, self-learning and behavior development.

Suggestions

1. Suggestions for using research

1) According to the results of this study that some teachers lack Google Classroom understanding, thus providing training is considered as the solution of pre-using the e-PLC.

2) In reference to the results of lesson study in which participants did not follow the timeline of program schedule, we suggest that model teacher and buddy teacher manage and plan together.

3) It would be helpful for the buddy teacher and pre-service teacher to be in sync about the reading materials either to read online or through print. They should discuss together and plan the method they prefer.

2. Suggestions for principles

1) The schools should use Ethic Professional Learning Community: e-PLC with new teachers and experienced teachers.

2) Using Ethic Professional Learning Community: e-PLC in school, teachers are supported to develop teaching, evaluate and do action research.

3) Ethic professional learning community: e-PLC can be disseminated for expanded use in other regions of Thailand.

3. Suggestions for further research

1) The schools should use Ethic Professional Learning Community: e-PLC via ICT processes for improving teaching the variety learning skills and important skills of 21st century learners. Also, continuously use and collect time series results for studying progression.

2) Ethic Professional Learning Community: e-PLC processes should be developed in other aspects for improving teachers' competency in doing research, using technology, assessment and evaluation and curriculum development.

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